

Problems

- [1] Describe the purpose of the D- and W-bits found in some machine language instructions.
- [2] In a machine language instruction, what information is specified by the MOD field?
- [3] If the register field (REG) of an instruction contains a 010 and $W = 0$, what register is selected, assuming that the instruction is a 16-bit mode instruction? DL
- [4] What memory-addressing mode is specified by $R/M = 001$ with $MOD = 00$ for a 16-bit instruction? *base + index A.M.*
- [5] Convert an 8B07H from machine language to assembly language.
- [6] Convert an 8B1E004CH from machine language to assembly language.
- [7] If a `MOV SI, [BX+2]` instruction appears in a program, what is its machine language equivalent?
- [8] If a `MOV ESI, [EAX]` instruction appears in a program

new word

1	0	0	0	1	0	1	1
						DW	

disp
`MOV AX, [BX]`

0	0	0	0	0	1	1	1
						REG	

disp

1	0	0	0	1	0	1	1
						DW	

`MOV BX, [BX+4040]`

0	0	0	1	1	1	1	0
						REG	

`MOV BX, [0040H]`

0	0	0	0	1	0	1	1
						DW	

0	1	1	0	1	1	1	0
						REG	

8B1E004CH

for the Pentium II microprocessor operating in the 16-bit instruction mode, what is its machine language equivalent?

10001011 01110000

[17]

[9] What is wrong with a MOV CS,AX instruction?

[10] Which registers move onto the stack with the PUSHAD instruction?

[18]

[11] Which registers move onto the stack for a PUSHAD instruction?

[19]

[12] Describe the operation of each of the following instructions:

[21]

(a) PUSH AX

(b) POP EAX

[22]

[13] Explain how the PUSH [DI] instruction functions.

[14] What registers are placed on the stack by the PUSHAD instruction? In what order?

[23]

[15] What does the PUSHAD instruction accomplish?

[16] Which instruction places the EFLAGS on the stack in

the Pentium 4 microprocessor?

- [17] Explain what happens when the PUSH BX instruction executes. Make sure to show where BH and BL are stored. (Assume that SP = 0100H and SS = 0200H.)
- [18] Repeat above question for the PUSH EAX instruction.
- [19] Describe how the LDS BX, NUMB instruction operates.
- [20] Develop a sequence of instructions that move the contents of data segment memory locations NUMB and NUMB+1 into BX, DX, and SI.
- [21] What does the REP prefix accomplish and what type of instruction is it used with?
- [22] Develop a sequence of instructions that copy 12 bytes of data from an area of memory addressed by SOURCE into an area of memory addressed by DEST.
- [23] Select an assembly language instruction that exchanges the contents of the EBX register with the ESI register.

- [24] Write a short program that uses the XLAT instruction to convert the BCD numbers 0-9 into ASCII-coded numbers 30H-39H. Store the ASCII-coded data in a TABLE located within the data segment.
- [25] Select an instruction that moves a byte of data from the memory location addressed by the BX register, in the extra segment, into the AH register.
- [26] Develop a sequence of instructions that exchange the contents of AX with BX, ECX with EDX, and SI with DI.
- [27] What is accomplished by the CMOVNE CX,DX instruction in the Pentium Pro microprocessor?
- [28] Describe the purpose of the following assembly language directives: DB, DW, and DD.
- [29] Develop a near procedure that stores AL in four consecutive memory locations, within the data segment, as addressed by the DI register.
- [30] Develop a far procedure that copies contents of the word-sized memory location CS:DATA1 into AX, BX, CX,

DX, and SI.

- [31] Write a program to output the word of data in BX to ports 8004H and 8005H.
- [32] Write a program to fill the 256 bytes block of memory in the extra segment beginning at address BLOCK with the data byte 20H (ASCII space).
- [33] Write a program to output 256 bytes from data table beginning at address TABLE to output port A0H.
- [34] Write a program that will move a 100 bytes from data table LIST to data table BLK.